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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,042	07/25/2003	Michael Marquant	RDID 02081 US	4047

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EXAMINER

HYUN, PAUL SANG HWA

ART UNIT	PAPER NUMBER
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1797

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/628,042	Applicant(s) MARQUANT ET AL.	
	Examiner PAUL S. HYUN	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,6-8,11-22 and 24-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,4,6-8 and 11-22 is/are allowed.
- 6) ☒ Claim(s) 24-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The amendment filed on February 24, 2009 has been acknowledged. Claims 1, 2, 4, 6-8, 11-22 and 24-28 are currently pending. Applicant amended claims 1 and 24.

Claims 1-4, 6-8 and 11-22 were previously indicated as being allowable if rewritten or amended to overcome the rejection under 35 U.S.C. 112, 2nd paragraph cited in the previous Office action.

The claim rejection under 35 U.S.C. section 112 cited in the previous Office action has been withdrawn in light of the amendment.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims **24** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow (US 6,167,910) in view of Arnold et al. (US 6,210,986 B1).

Chow discloses a microfluidic device for conducting fluid analysis. The device comprises a plurality of layers (e.g. five layers, see Abstract), wherein the layers are staggered in a step-like manner (see Fig. 2) and each layer comprises a microfluidic channel formed therein (see Fig. 4). Each channel can comprise a layer of insulating material (see line 36, col. 4) or electrodes (see lines 24-26, col. 3). The device disclosed

Art Unit: 1797

by Chow differs from the claimed invention in that the sidewalls of the channels are not defined by a gap between two pieces of material. Rather, the channels disclosed by Chow are formed by etching grooves into individual substrates.

Arnold et al. disclose a microfluidic device comprising multi-layered channels (see Fig. 6C). The sidewalls of the channels are defined by a gap between two pieces of spacers 230. Arnold et al. disclose that etching produces channels that are wider at the top than at the bottom whereas channels formed by spacers exhibit a more uniform width (see lines 1-10, col. 2). In light of the disclosure of Arnold et al., it would have been obvious to one of ordinary skill in the art to form the channels disclosed by Chow using spacers rather than etching.

Claim **25** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Arnold et al. as applied to claim 24, and further in view of Ekström et al. (US 5,376,252).

Neither Chow nor Arnold et al. disclose an insulating layer that is in the form of a foil material.

Ekström et al. disclose a microfluidic device comprising an insulating layer 2 made from electrically insulating foil (see lines 60-65, col. 3). In light of the disclosure of Ekström et al., it would have been obvious to one of ordinary skill in the art to use a foil material as the insulating layer in the modified Chow device to minimize the thickness of the device.

Claim **26** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Arnold et al. as applied to claim 24, and further in view of Yager et al. (US 6,482,306 B1).

Neither Chow nor Arnold et al. disclose an electrode in the form of a coating.

Yager et al. disclose a microfluidic channel comprising electrodes wherein the electrodes are coated to the channel surface (see claim 11). In light of the disclosure of Yager et al., it would have been obvious to one of ordinary skill in the art to incorporate the electrodes disclosed by Chow as a coating to minimize the thickness of the microfluidic device.

Claims **27 and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Arnold et al. and Yager et al. as applied to claim 26, and further in view of Oloman et al. (US 4,118,305).

None of Chow, Arnold et al. and Yager et al. disclose a hydrophilic insulating material comprising perforations.

Oloman et al. disclose an electrochemical device for conducting reactions wherein the device comprises an electrode, a counter electrode and a porous, hydrophilic insulating material separating the two electrodes (see claim 1). The porous insulating material permits free flow of liquid between the electrodes while providing electrical insulation between the electrodes. In light of the disclosure of Oloman et al., it would have been obvious to one of ordinary skill in the art to provide a hydrophilic,

Art Unit: 1797

porous insulating layer around the electrodes of the modified Chow device so that flow of liquid to the electrodes is permitted while providing electrical insulation.

Allowable Subject Matter

Claims **1-4, 6-8 and 11-22** are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Chow discloses a microfluidic device for conducting fluid analysis. The device comprises a plurality of layers wherein the layers are staggered in a step-like manner and each layer comprises a microfluidic channel formed therein. However, Chow does not disclose layers of electrodes arranged in a step-like manner. The staggered arrangement disclosed by Chow provides an unobstructed window to the optical detection area of each channel (see lines 5-8, col. 13). Based on the disclosure, there is no motivation or suggestion to stagger the layers such that the electrodes are exposed despite the fact that the channels disclosed by Chow comprise electrodes.

Response to Arguments

Applicant's argument with respect to claims 24-28 has been fully considered but it is not persuasive.

Applicant argues that claims 24-28 are patentable for the same reason claims 1-4, 6-8 and 11-22 are patentably distinct from the prior art. Specifically, Applicant argues that prior art does not disclose a device comprising multiple layers having channels formed therein, wherein the layers are staggered with respect to one another such that electrodes disposed between the layers are exposed. This argument is not persuasive

Art Unit: 1797

because claims 24-28 do not recite that the claimed invention comprises electrode layers or that the electrode layers are exposed. For the foregoing reason, the rejections of claims 24-28 are maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL S. HYUN whose telephone number is (571)272-8559. The examiner can normally be reached on Monday-Friday 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paul S Hyun/
Examiner, Art Unit 1797

/Jill Warden/
Supervisory Patent Examiner, Art Unit 1797